

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:	§	EXAMINER:	Unassigned
David H. McConville	§		
Richard R. Schrock	§		
	§		
SERIAL NUMBER: New Application	§	GROUP ART UNIT:	Unassigned
	§		
FILED: May 24, 2001	§	ATTY. DOCKET NO.:	1999U019D1.US
	§		
FOR: : Method Of Polymerization	§	DATE:	May 24, 2001
	§		

Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Prior to examination, please amend this application as follows.

In the Specification

On page 1, before the section entitled "Field of the Invention" please insert the following new section:

Related Application Data

This application is a Divisional of U.S. Patent Application, Serial No. 09/312,878, now issued as U.S. Patent No. _____.

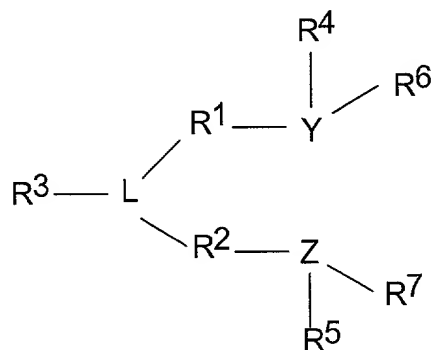
In the Claims

Please delete claims 1-29.

Please enter the following as replacements for claims 30, 33-37, 44-49, and 51. A version with markings to show changes made appears at the end of this amendment.

30. (Once Amended) A method to prepare a metal compound comprising reacting a neutral ligand with a compound represented by the formula M^nX_n where M is a group 3-14 metal, n is the oxidation state of M, and X is an anionic group in a non-coordinating or weakly coordinating solvent, at about 20 to about 100 °C, then treating the mixture with an excess of an alkylating agent, then recovering the metal complex.

33. (Once Amended) The method of claim 30 wherein the neutral ligand is represented by the formula:



where Y is a group 15 element,

Z is a group 15 element,

L is a group 15 or 16 element,

R¹ and R² are independently a C₁ to C₂₀ hydrocarbon group, a heteroatom containing group, silicon, germanium, tin, lead, or phosphorus,

R¹ and R² may be interconnected to each other,

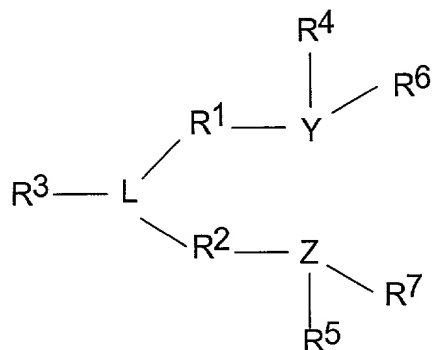
R³ is absent, hydrogen, a group 14 atom containing group, a halogen, or a heteroatom containing group,

R⁴ and R⁵ are independently an aryl group, a substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, or a multiple ring system,

R⁶ and R⁷ are independently absent, hydrogen, halogen, a heteroatom, a hydrocarbyl group, or a heteroatom containing group.

34. (Once Amended) A method to prepare a metal adduct comprising reacting a neutral ligand with a compound represented by the formula M^nX_n where M is Zr or Hf, n is the oxidation state of M, X is a halogen in a non-coordinating or weakly coordinating solvent, at 20°C or more, then recovering the metal adduct.

35. (Once Amended) The method of claim 34, wherein the neutral ligand is represented by the formula:



where Y is a group 15 element,

Z is a group 15 element,

L is a group 15 or 16 element,

R¹ and R² are independently a C₁ to C₂₀ hydrocarbon group, a heteroatom containing group, silicon, germanium, tin, lead, or phosphorus,

R¹ and R² may be interconnected to each other,

R³ is absent, hydrogen, a group 14 atom containing group, a halogen, or a heteroatom containing group,

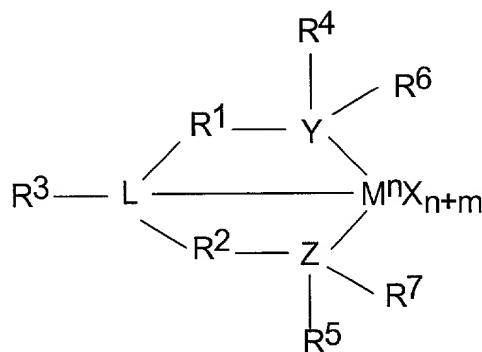
R⁴ and R⁵ are independently an aryl group, a substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, or a multiple ring system,

R⁶ and R⁷ are independently absent, hydrogen, halogen, a heteroatom, a hydrocarbyl group, or a heteroatom containing group

36. (Once Amended) A reaction product of a neutral ligand reacted with a compound represented by the formula M^nX_n where M is Zr or Hf, n is the oxidation state of M, X is an

anionic leaving group, in a non-coordinating or weakly coordinating solvent at about 20 to about 100 °C.

37. (Once Amended) A composition represented by the formula:



wherein

M is a group 3 to 14 metal,

each X is independently an anionic leaving group,

n is the oxidation state of M,

m is the formal charge of a ligand comprising Y, Z and L,

Y is a group 15 element,

Z is a group 15 element,

L is a group 15 or 16 element,

R¹ and R² are independently a C₁ to C₂₀ hydrocarbon group, a heteroatom containing group, silicon, germanium, tin, lead, or phosphorus,

R¹ and R² may be interconnected to each other,

R³ is absent, hydrogen, a group 14 atom containing group, a halogen, or a heteroatom containing group,

R⁴ and R⁵ are independently an aryl group, a substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, or a multiple ring system,

R⁶ and R⁷ are independently absent, hydrogen, halogen, a heteroatom, a hydrocarbyl group, or a heteroatom containing group.

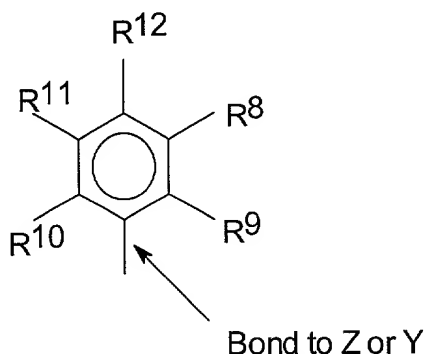
44. (Once Amended) The composition of claim 37 wherein R³ is absent, hydrogen or methyl.

45. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently a hydrocarbon group having up to 20 carbon atoms.

46. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently an aryl group or an aralkyl group.

47. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently an aralkyl group.

48. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently a group represented by the following formula:

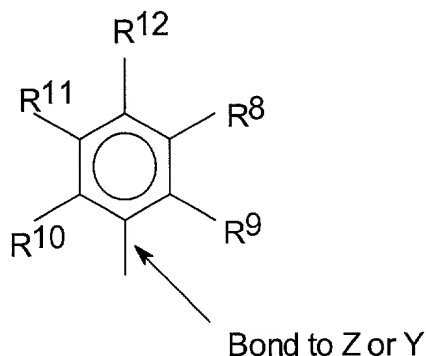


wherein

each R^8 to R^{12} are independently hydrogen, a C_1 to C_{20} alkyl group, a heteroatom, or a heteroatom containing group having up to 40 carbon atoms, and any two R groups can combine to form a cyclic group or a heterocyclic group.

49. (Once Amended) The composition of claim 48 wherein R^8 , R^9 , R^{10} , R^{11} , and R^{12} are each independently selected from the group consisting of methyl, ethyl, propyl, and butyl.

51. (Once Amended) The composition of claim 37 wherein M is zirconium, each of Y, Z and L is nitrogen, each of R¹ and R² is -CH₂-CH₂, R³ is hydrogen, R⁶ and R⁷ are absent and each of R⁴ and R⁵ is a group represented by the formula:



wherein

each R⁸ to R¹² are independently hydrogen, a C₁ to C₂₀ alkyl group, a heteroatom, or a heteroatom containing group having up to 40 carbon atoms, and any two R groups can combine to form a cyclic group or a heterocyclic group.

Should the Examiner have any questions or require any additional information please contact the undersigned.

Respectfully submitted,

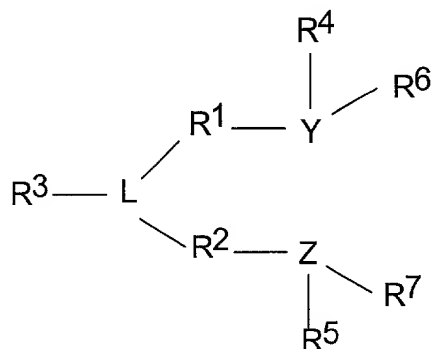
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

30. (Once Amended) A method to prepare a metal compound comprising reacting a neutral ligand with a compound represented by the formula M^nX_n [(]where M is a group 3-14 metal, n is the oxidation state of M, and X is an anionic group[)] in a non-coordinating or weakly coordinating solvent, at about 20 to about 100 °C, then treating the mixture with an excess of an alkylating agent, then recovering the metal complex.

33. (Once Amended) The method of claim 30 wherein the neutral ligand is represented by the formula:



where Y is a group 15 element,

Z is a group 15 element,

L is a group 15 or 16 element,

R^1 and R^2 are independently a C_1 to C_{20} hydrocarbon group, a heteroatom containing group, silicon, germanium, tin, lead, or phosphorus[, a halogen],

R^1 and R^2 may [also] be interconnected to each other,

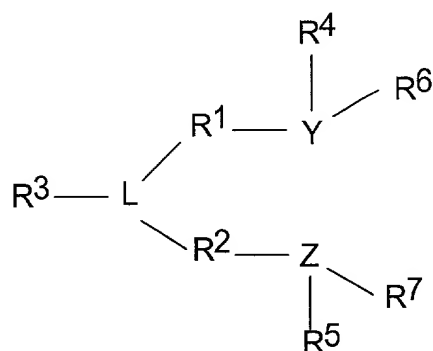
R^3 is absent, [or is] hydrogen, a group 14 atom containing group, a halogen, or a heteroatom containing group,

R^4 and R^5 are independently an aryl group, a substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, or a multiple ring system,

R^6 and R^7 are independently absent, [or] hydrogen, halogen, a heteroatom, [or] a hydrocarbyl group, or a heteroatom containing group.

34. (Once Amended) A method to prepare a metal adduct comprising reacting a neutral ligand with a compound represented by the formula M^nX_n [(]where M is Zr or Hf, n is the oxidation state of M, X is a halogen[)] in a non-coordinating or weakly coordinating solvent, at 20°C or more, then recovering the metal adduct.

35. (Once Amended) The method of claim 34, wherein the neutral ligand is represented by the formula:



where Y is a group 15 element,

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L is a group 15 or 16 element,

R^1 and R^2 are independently a C_1 to C_{20} hydrocarbon group, a heteroatom containing group, silicon, germanium, tin, lead, or phosphorus[, a halogen],

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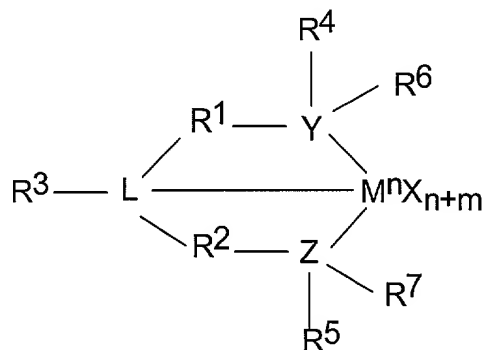
R^3 is absent, [or is] hydrogen, a group 14 atom containing group, a halogen, or a heteroatom containing group,

R^4 and R^5 are independently an aryl group, a substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, or a multiple ring system,

R^6 and R^7 are independently absent, [or] hydrogen, halogen, a heteroatom, [or] a hydrocarbyl group, or a heteroatom containing group

36. (Once Amended) [The]A reaction product of a neutral ligand reacted with a compound represented by the formula M^nX_n [(]where M is Zr or Hf, n is the oxidation state of M, X is an anionic leaving group[)], in a non-coordinating or weakly coordinating solvent at about 20 to about 100 °C.

37. (Once Amended) A composition represented by the formula:



wherein

M is a group 3 to 14 metal,

each X is independently an anionic leaving group,

n is the oxidation state of M,

m is the formal charge of a ligand comprising Y, Z and L [the YZL ligand],

Y is a group 15 element,

Z is a group 15 element,

L is a group 15 or 16 element,

R^1 and R^2 are independently a C_1 to C_{20} hydrocarbon group, a heteroatom containing group, silicon, germanium, tin, lead, or phosphorus, [a halogen,]

R^1 and R^2 may [also] be interconnected to each other,

R^3 is absent, [or is] hydrogen, a group 14 atom containing group, a halogen, or a heteroatom containing group,

R^4 and R^5 are independently an aryl group, a substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, or a multiple ring system,

R^6 and R^7 are independently absent, [or] hydrogen, halogen, a heteroatom, [or] a hydrocarbyl group, or a heteroatom containing group.

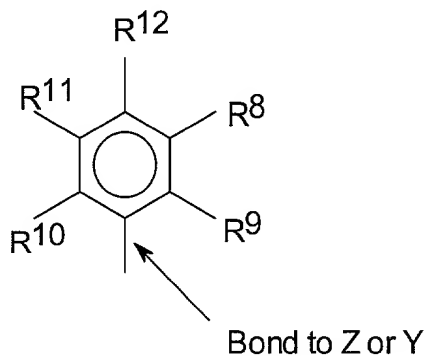
44. (Once Amended) The composition of claim 37 wherein R^3 is absent, [or] hydrogen or methyl.

45. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently a [C_1 to C_{20}] hydrocarbon group having up to 20 carbon atoms.

46. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently [a C_1 to C_{20}] an aryl group or [a C_1 to C_{20}] an aralkyl group.

47. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently [a cyclic] an aralkyl group.

48. (Once Amended) The composition of claim 37 wherein R^4 and R^5 are independently a group represented by the following formula:



wherein

each R^8 to R^{12} are independently hydrogen, [or] a C_1 to C_{20} alkyl group, a heteroatom, or a heteroatom containing group having up to 40 carbon atoms, and any two R groups can combine to form a cyclic group or a heterocyclic group.

49. (Once Amended) The composition of claim 48 wherein

R^8 , [is methyl, ethyl, propyl or butyl, and/or]

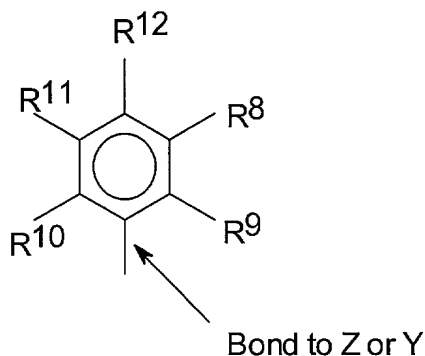
R^9 , [is methyl, ethyl, propyl or butyl, and/or]

R^{10} , [is methyl, ethyl, propyl or butyl, and/or]

R^{11} , and [is methyl, ethyl, propyl or butyl, and/or]

R^{12} [is] are each independently selected from the group consisting of methyl, ethyl, propyl, [or] and butyl.

51. (Once Amended) The composition of claim 37 wherein M is zirconium, each of Y, [A] Z and L is nitrogen, each of R^1 and R^2 is $-\text{CH}_2-\text{CH}_2$, R^3 is hydrogen, R^6 and R^7 are absent and each of R^4 and R^5 is a group represented by the formula:



wherein each R^8 to R^{12} are independently hydrogen, [or] a C_1 to C_{20} alkyl group, a heteroatom, or a heteroatom containing group having up to 40 carbon atoms, and any two R groups can combine to form a cyclic group or a heterocyclic group.